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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/645,501	08/22/2003	David Peyton Cox	200206848-1	8776
22879 7590 02/20/2009 HEWLETT PACKARD COMPANY P O BOX 272400, 3404 E. HARMONY ROAD INTELLECTUAL PROPERTY ADMINISTRATION FORT COLLINS, CO 80527-2400			EXAMINER ZHEN, LI B	
			ART UNIT 2194	PAPER NUMBER
			NOTIFICATION DATE 02/20/2009	DELIVERY MODE ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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<b>Office Action Summary</b>	<b>Application No.</b> 10/645,501	<b>Applicant(s)</b> COX, DAVID PEYTON	
	<b>Examiner</b> LI B. ZHEN	<b>Art Unit</b> 2194	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 25 November 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3, 6-8, 10-18, 20-22 and 24-26 is/are rejected.
- 7) ☒ Claim(s) 4, 5, 9, 19, 23, 27 and 28 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

1. Claims 1 – 28 are pending in the application.

#### ***Allowable Subject Matter***

2. Claims 4, 5, 9, 19, 23, 27 and 28 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

#### ***Response to Arguments***

3. Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection.

#### ***Claim Objections***

4. Claim 25 is objected to because of the following informalities: claim 25 refers to the "machine-readable code arrangement of claim 21"; however, claim 21 recites an apparatus. Appropriate correction is required.

#### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**6. Claims 1-3, 6-8, 10-18, 20-22 and 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 7,222,348 to Athreya et al. [hereinafter Athreya, previously cited] in view of U.S. Patent No. 6,832,379 to Zeryck et al. [hereinafter Zeryck].**

7. As to claim 6, Athreya teaches a method used while assembling in processor memory a stack of device objects (DOs) representing a device [device stack of the drivers for the device; col. 7, lines 8 – 25], the operating system of the processor having a kernel [col. 6, lines 8 – 25], the device having a corresponding physical device object [col. 7, lines 8 – 25], the method comprising:

determining a uni-role first driver [lower level drivers control the physical devices; col. 2, lines 21 – 30] for the device [col. 2, lines 20 – 30];

invoking the first driver [filter add device function 450 interface to the lower level driver 250; col. 7, lines 8 – 25], which includes passing the PDO of the device to the first driver [filter add device function 450 creates and initializes a new filter device object for the corresponding physical device object; col. 7, lines 8 – 25]; and

passing the PDO from the first driver to the multi-role second driver or to a component of the kernel [initializes a new filter device object for the corresponding physical device object, then it attaches the device object to the device stack of the drivers for the device; col. 7, lines 8 – 25]. Athreya does not teach determining a uni-role first driver registered to the device.

However, Zeryck teaches determining a uni-role first driver registered to the device [Installing the LDD into the LU 110 stack involves registering the LDD with both the LDD registration system; col. 9, lines 44 – 52] and a multi-role device driver [device driver stack; col. 4, lines 22 – 67].

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the invention of Athreya to incorporate the features of Zeryck. One of ordinary skill in the art would have been motivated to make the combination because this enables the user to dynamically install or remove one or more layered device driver in a device driver stack [col. 3, lines 57 – 65 of Zeryck].

8. As to claim 7, Athreya as modified teaches a method used while assembling in processor memory a stack of device objects (DOs) representing a device [device stack of the drivers for the device; col. 7, lines 8 – 25 of Athreya], the device having a corresponding physical device object (PDO) [col. 7, lines 8 – 25 of Athreya], the method comprising:

determining a driver registered to the device [col. 9, lines 44 – 52 of Zeryck];

invoking the driver, which includes passing the PDO of the device to the driver [filter add device function 450 creates and initializes a new filter device object for the corresponding physical device object; col. 7, lines 8 – 25 of Athreya]; and

passing the PDO away from the driver without attempting to attach to the stack a DO corresponding to the driver [col. 8, lines 52 – 67, col. 9, lines 8 – 22 and col. 12, lines 20 – 33 of Zeryck].

9. As to claim 13, Athreya as modified teaches a method used while assembling in processor memory a stack of device objects (DOs) representing a device [device stack of the drivers for the device; col. 7, lines 8 – 25 of Athreya], the method comprising:

providing a multi-role driver for a plurality of device types [universal multipath driver (UMD) 220; col. 6, line 55 – col. 7, line 10 of Athreya]; but

not registering, in the registry of the operating system, the multi-role driver as having a role in assembly of the stack [col. 8, lines 52 – 67, col. 9, lines 8 – 22 and col. 12, lines 20 – 33 of Zeryck].

10. As to claim 14, Athreya teaches the multi-role driver is operable to run in the WINDOWS Driver Model environment [col. 6, lines 8 – 25].

11. As to claim 1, Athreya as modified teaches a method used while building in processor memory a stack of device objects (DOs) representing a device [col. 7, lines 8 – 25 of Athreya], there being a multi-role driver [universal multipath driver (UMD) 220; col. 6, line 55 – col. 7, line 10 of Athreya] for a plurality of roles at least one of which corresponds to the device, the method comprising:

registering [col. 9, lines 44 – 52 of Zeryck] a plurality of uni-role helper drivers [lower level drivers control the physical devices; col. 2, lines 21 – 30 of Athreya] so as to uniquely correspond to the plurality of roles, respectively [col. 2, lines 20 – 30 of Athreya],

each helper driver mapping uniquely to one of the multiple roles of the multi-role driver, respectively [col. 9, lines 21 – 35 of Zeryck];

indirectly specifying a corresponding one of the multiple roles of the multi-role driver by specifying the helper driver mapped thereto [col. 8, lines 52 – 67, col. 9, lines 8 – 22 and col. 12, lines 20 – 33 of Zeryck and col. 6, line 55 – col. 7, line 10 of Athreya].

12. As to claim 8, Athreya as modified teaches a method used while assembling in processor memory a stack of device objects (DOs) representing a device [col. 7, lines 8 – 25 of Athreya], there being a multi-role driver for a plurality of roles at least one of which corresponds to the device [col. 6, line 55 – col. 7, line 10 of Athreya], the device having a corresponding physical device object (PDO) [col. 7, lines 8 – 25 of Athreya], the method comprising:

providing a plurality of DOPush functions [col. 6, lines 60 – 67 of Athreya] in a multi-role driver [col. 6, line 55 – col. 7, line 10 of Athreya];

loading the multi-role driver into the memory so as to arrange for each of the DOPush functions to be directly invokable by a code portion external [col. 9, line 62 – col. 10, line 13 of Zeryck] to the multi-role driver [driver entry 410 provides an entry point for the UMD 220 in response to an IRP issued by the higher level driver 218; col. 6, line 55 – col. 7, line 10 of Athreya]; and

invoking, externally to the multi-role driver, one of the DOPush functions, which includes passing the PDO of the device to the invoked DOPush function [col. 6, lines 60

Art Unit: 2194

– 67 of Athreya and col. 8, lines 52 – 67, col. 9, lines 8 – 22 and col. 12, lines 20 – 33 of Zeryck].

13. As to claim 15, Athreya as modified teaches a code arrangement on a machine-readable medium execution of which facilitates assembling in processor memory a stack of device objects (DOs) representing a device [col. 7, lines 8 – 25 of Athreya], the machine-readable code arrangement comprising:

a multi-role driver code portion which corresponds to the device [col. 6, line 55 – col. 7, line 10 of Athreya], the multi-role driver code portion having exported functions [col. 9, lines 8 – 22 of Zeryck] corresponding to the multiple roles of the multi-role driver code portion [col. 2, lines 20 – 30 of Athreya], respectively;

a plurality of helper driver code portions [col. 9, lines 44 – 52 of Zeryck and col. 2, lines 20 – 30 of Athreya]; and

an installer code portion for registering [col. 9, lines 44 – 52 of Zeryck] the plurality of helper driver code portions so as to uniquely map to the multiple roles [col. 9, lines 21 – 35 of Zeryck], respectively;

each helper driver code portion being operable to receive a corresponding PDO [col. 7, lines 8 – 25 of Athreya] and pass the PDO to the multi-role driver code portion without attempting to attach to the stack a DO corresponding to the helper driver code portion [col. 6, lines 60 – 67 of Athreya and col. 8, lines 52 – 67, col. 9, lines 8 – 22 and col. 12, lines 20 – 33 of Zeryck].



Art Unit: 2194

14. As to claim 20, Athreya as modified teaches an apparatus having memory in which is buildable a stack of device objects (DOs) representing a device attached to the apparatus [col. 7, lines 8 – 25 of Athreya], the apparatus comprising:

multi-role driver means [col. 6, line 55 – col. 7, line 10 of Athreya] for operating according to a plurality of roles [col. 2, lines 20 – 30 of Athreya];

a plurality of helper driver means [col. 7, lines 8 – 25 of Athreya] registered so as to uniquely correspond to the plurality of roles [col. 9, lines 44 – 52 of Zeryck], respectively, of the multi-role driver [col. 2, lines 20 – 30 of Athreya]; and

means for selectively invoking the multi-role driver according to one of the multiple roles via invoking the corresponding helper driver mapped thereto [col. 6, lines 60 – 67 of Athreya and col. 8, lines 52 – 67, col. 9, lines 8 – 22 and col. 12, lines 20 – 33 of Zeryck].

15. As to claim 24, this is a program product claim that corresponds to method claim 1; therefore, this claim is rejected for the same reasoning as applied to claim 1 above.

16. As to claim 2, Athreya teaches the multi-role driver and the helper drivers are operable to run in the WINDOWS Driver Model environment [col. 6, lines 8 – 25].

17. As to claim 3, Athreya teaches a role is determined according to a device type for which the multi-role driver is invoked and the extent of the stack at the point at which the multi-role driver is invoked [col. 6, lines 60 – 67].

18. As to claim 10, Athreya teaches the multi-role driver is operable to run in the WINDOWS Driver Model environment [col. 6, lines 8 – 25].

19. As to claim 11, Athreya teaches registering neither the multi-role driver nor the DOPush functions in the registry of the operating system as having a role in assembly of a stack representing a device [col. 6, line 55 – col. 7, line 10].

20. As to claim 12, Athreya teaches a role is determined according to a device type for which the multi-role driver is invoked and the extent of the stack at the point at which the multi-role driver is invoked [col. 6, lines 60 – 67].

21. As to claim 16, Athreya teaches the multi-driver code portion and the helper driver code portions are operable to run in the WINDOWS Driver Model environment [col. 6, lines 8 – 25].

22. As to claim 17, Athreya teaches a role is determined according to a device type for which the multi-role driver code portion is invoked and the extent of the stack at the point at which the multi-role driver code portion is invoked [col. 6, lines 60 – 67].

23. As to claim 18, Athreya teaches the exported functions are DOPush functions [col. 6, line 55 – col. 7, line 10].

24. As to claims 21-22, these are apparatus claims that correspond to method claims 2-3; therefore, these claims are rejected for the same reasoning as applied to claims 2-3 above.

25. As to claims 25-26, these are program product claims that correspond to method claims 2-3; therefore, these claims are rejected for the same reasoning as applied to claims 2-3 above.

#### **CONTACT INFORMATION**

26. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Li B. Zhen whose telephone number is (571) 272-3768. The examiner can normally be reached on Mon - Fri, 8:30am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng-Ai An can be reached on (571)272-3756. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2194

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Li B. Zhen/  
Primary Examiner, Art Unit 2194

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